Spokane River Dissolved Oxygen TMDL
Advisory Group Meeting
May 17, 2004, 4-6 pm
Department of Ecology Building

Meeting Notes

Ken Merrill began the meeting with an introduction of the Advisory Group members seated at the table and then had the individuals in the audience introduce themselves.

- Chris Butler was representing the Spokane Tribe in place of Brian Crossley
- Sid Fredrickson, from Coeur d' Alene, was not present
- Rob Lindsay has permanently replaced Stan Miller who retired from Spokane County

The following agenda was used for the meeting as previously distributed to the participants via email.

Agenda

4:00 - 4:10	Introductions
4:10 - 4:30	Review of Advisory Group Structure and Function
4:30 - 5:15	Review of Spokane River DO assessment report and possible approaches for TMDL
5:15 - 5:20	Break
5:20 - 6:00	Review TMDL schedule and agenda for next meeting

Ken handed out copies of his slides for the first agenda item (see attachment #1) where he presented a summary of the project timeline and an overview of TMDL issues and requirements driving the need for the Advisory Group. He then reviewed the structure and function of the advisory group. Available to the group were copies of the memorandum of agreement between EPA and Ecology regarding the implementation of the TMDL settlement. Ken briefly summarized what a TMDL was and what the necessary composition of a TMDL Submittal Report to EPA included. He also discussed other public participation opportunities.

Ken then handed out copies of his second presentation slides (see attachment #2) and gave a review of Spokane River water quality issues and load assessment/modeling report very similar to the information presented at the June 2003 public workshop.

Questions and discussion included:

- Explanation of pollution sources with the different modeling scenarios used in the load assessment report and that the "no point" scenario still included point sources upstream of the Idaho State boundary and mouth of the tributaries.
- Clarification that the "no source" scenario removed the pollutants, but did not remove the flow associated from any source because it would still be within the basin.

- How the model was calibrated and more information on calibration was available on the Ecology TMDL website.
- How the model boundary conditions upstream and downstream were determined and how would sources from Idaho and tributaries be included in future considerations.
- Lake Spokane response to nutrient loading and effects of algae on water quality including dissolved oxygen at depth
- How the new model and phosphorus standards relate to original Lake Spokane phosphorus standard and the way it was developed.

Discussions switched to TMDL scheduling after it was decided to skip the break and quickly focused on Use Attainability Analysis and its relation to the TMDL process.

- Ken reviewed the previously outlined timeline for project completion and pointed out that some things needed revised.
- Ken also informed the group that, based previous meeting discussions and the need to facilitate timely decisions, Ecology will not further delay TMDL development and will proceed independent of the UAA process. Any subsequent changes in criteria approved by Ecology and EPA, which may arise from future UAA work, will need to be factored into modifications of the TMDL as appropriate.
- Discussions ensued about possible solutions if it was determined there was no phosphorus discharge capacity could be allocated for point sources
- Management of the nonpoint pollution sources was also discussed.
- Ken explained how compliance schedules might be included in the implementation strategy and that the WQ standards require that the schedule should be the shortest time necessary, but 10 years is the longest that can be allowed.
- Discussion continued on the UAA process and the role of the DO TMDL advisory group and the distribution of proposals being distributed by the UAA sponsors to the DO TMDL advisory group.
- It was generally agreed that the UAA process and DO TMDL functions would be separate with separate meetings hosted by the sponsors of each.
- The UAA advisory group meeting was tentatively scheduled for June 15th with a TMDL advisory group meeting scheduled for the following week on June 22nd.

Attachment #1 – Slides from Ken's first presentation

Slide 1

Spokane River Dissolved Oxygen TMDL Advisory Group Meeting

May 17, 2004, 4-6 pm, Ecology Bldg

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Slide2

Advisory Group Members – DO TMDL

Hank	Nelson	Avista
Tom	Luce	Citizen at Large
Sid	Fredrickson	City of Coeur d' Alene
Bill	Rickard	City of Spokane
Bruce	Rawls	Division of Utilities - Spokane County
David	Ragsdale	EPA - Region 10
Darren	Brandt	Idaho DEQ
Rick	Fink	Inland Empire Paper
Pat	Blau	Kaiser Aluminum
Galen	Buterbaugh	Lake Spokane Protection Assoc.
Amber	Waldref	Lands Council
Rachael	Paschal-Osborn	Sierra Club
Walt	Edelen	Spokane CD
Stan	Miller	Spokane County
Bill	Gilmore	Spokane County
Jeff	Selle	Spokane Regional Chamber of Commerce
Brian	Crossley	Spokane Tribe of Indians
Neil	Kersten	Spokane Valley
Lynn	Wells	State Parks Commission
Tony	Delgado	Stevens County Commissioners
Ken	Merrill	WA Dept of Ecology
Dale	Arnold	Wastewater Mngmt - City of Spokane
Chris	Donley	WDFW

Slide 3

Past Milestones

Timeline for a TMDL to Protect Spokane River and Lake Spokane Dissolved Oxygen

Past Milestones

- **February 1998: Project request** for basin planning in response to several proposed increases in discharge without evaluations of proposed loadings and cumulative impacts on river/reservoir water quality

- **May 1999**: Draft Study Plan submitted and discussed with Spokane River ***Phosphorus Tech. Advisory Committee (TAC)*** for **review and comment**. Suggested that Idaho modeling might be integrated with the WA effort and worked with EPA for supplemental funding of Idaho dischargers to finish their effort

- **July 1999**: Final Draft of study plan QAPP again submitted to ***Spokane River Phosphorus TAC*** with another request for **review and comment**

- **August 1999**: **Sampling Surveys begin**, but abbreviated due to much higher than normal summer flows

- **October 1999**: ***Meeting with City of Spokane*** discussing many discharge issues including, CSO, stormwater, river monitoring, and DO modeling

- **November 1999 - March 2000**: **Developed QUAL2E and CEQUALW2** for Spokane River and Long Lake, WA

Past Milestones (cont.)

- **January & April 2000**: **Conducted additional sampling** of winter effluent UBOD at request of discharger group
- **April - September 2000**: ***Workshop for presentation of preliminary QUAL2E model sensitivity test results*** from with agencies and dischargers – continued sampling surveys
- **August 2000**: Ecology staff received training from Corps of Engineers (COE) on new integrated version of model CEQUALW2*V3*
- **August 2000**: Received general and technical **comments from the City of Spokane with response provided** by ERO and EAP
- **October 2000**: Received Corps of Engineers (COE) Planning Assistance Grant and **finalized contract for development of CEQUALW2*V3***
- **November 2000**: ***Workshop for agencies and dischargers*** to provide updated timeline and allow Tom Cole (COE) to present overview of the new model and provide opportunities for discussions of issues.

Past Milestones (cont.)

- **Spring 2001: Dischargers request delay in model development to allow for more calibration sampling be conducted in 2001**
- **Spring 2001**: **Spokane County refined the preferred alternative for a new treatment plant** with discharge upstream of the City and diverting some of the existing County flow from the City's wastewater system.
- **Winter 2001**: With the support of Idaho, pursued supplemental EPA **funding to integrate the upper river into CEQUALW2-V3**
- **Winter 2001/02**: Revised model to calibrate to 2001 data for and use 2001 as critical design year
- **February 2002**: **Corps/Ecology provides modeling training** class to selected Ecology staff *and stakeholder* representatives
- **March 2002**: ***Public Notice of Ecology's study/data summary report*** with appended COE model report available on website. Draft copy of model made available to public upon request.
- **April - September 2002**: Contractor begins further model calibration with 2001 data and integration of Idaho reach

Past Milestones (cont.)

- **April 1, 2002**: **Comment period closes** on draft data summary report and initial model development reports.

- **June 2002**: ***Conduct a public workshop*** and release draft interim technical memo for review and formal ***public comment*** and of interim model results with potential loading scenarios
- **October 2002**: Water Quality Program Manager and Section Manager ***meet with City of Spokane Directors of Public Works and Wastewater Management*** to discuss local concerns about TMDL process

- **December 2002:** Conduct ***public workshop*** to review 2001 data and predicted WQ from model. Discuss previously submitted comments and resolution. Begin discussion about organization of a facilitated TMDL advisory committee

- **January 2003:** ***Meeting with City, County, and Liberty Lake, wastewater staff*** to explain potential impacts of new water quality standards and discuss the process of conducting a use attainability analyses

Past Milestones (cont.)

- **February 2003**: ***Public workshop for organization of advisory group***, develop preliminary work agenda, and review UAA process
- **February 2003**: ***Meeting with Dischargers Group to review UAA process and scope of work***
- **February 2003**: Spokane regional WW planning at Spokane Valley's initiative. ***Reviewed preliminary WQ model results with all municipals present .*** Discussed possible implications and solutions
- **March 2003**: Review and comment on UAA scope of work from sponsors
- **March 2003**: Pre-Meeting with UAA sponsors followed by **meeting with interim-Advisory Group and UAA sponsors** to discuss TMDL and UAA process
- **May 2003**: ***First official Advisory Group meeting*** outline of tasks with incorporation for UAA as appropriate
- **June 2003**: ***Conduct Public Workshop and distribute draft Dissolved Oxygen Pollutant Loading Assessment Technical Report for formal public comment***
- **October 2003**: First **response to comments** on technical report without City of Spokane comments which were inadvertently omitted. Electronically distributed document to Advisory Group and other commenters

Past Milestones (cont.)

- **November 2003**: **UAA forum for dischargers** arranged by Ecology to discuss process for UAA
- **November 2003**: Letter from program director sent to Spokane County **with commitment to permit the new facility** based on proposed interim permit limits from the approved facility plan.
- **January 2004**: Meeting with EPA and Ecology staff to discuss TMDL for DO and permitting questions
- **February 2004**: Complete Response to Comments with addendum distributed to Advisory Group and commenters.
- **February 2004**: Spokane River model with final calibration made available on web site along with PSU technical review report.
- **February 2004**: **Final Technical Report incorporating responses to comments and final model calibration** http://www.ecy.wa.gov/biblio/0403006.html
- **March and May 2004**: Ecology arranged meetings with discharger and EPA to discuss TMDL and UAA

Slide 10

MEMORANDUM OF AGREEMENT BETWEEN

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

AND

THE WASHINGTON STATE DEPARTMENT OF ECOLOGY

REGARDING

THE IMPLEMENTATION OF

SECTION 303(d) OF THE FEDERAL CLEAN WATER ACT

October 29, 1997

TMDLs submitted by Ecology shall include:

(1) a description of the applicable water quality standards, including the uses to be protected, and the problems to be corrected;

(2) an analysis of pollution sources contributing to the problem;

(3) a description of alternative allocation strategies explored;

(4) a final allocation scheme and a description of how the allocations were developed, including loading capacity estimation, load allocations, waste load allocations and margin of safety;

(5) for those TMDLs in which wasteload allocations (WLA) to point sources are based on the assumption that loads from nonpoint sources will be reduced, reasonable assurance that the nonpoint source load allocations (LA) will be achieved (e.g., control actions and implementation schedules); and

(6) any other components required under the CWA and EPA's implementing regulations.

Summary implementation strategies (SIS) will identify:

(1)the timeframe for meeting water quality standards;

(2) the approaches to be used to meet load and wasteload allocations (WLA), which consider flow rates and seasonal variations;
(3) interim targets, if appropriate, with linkages to the pollution sources;
(4) a monitoring strategy to measure implementation activities and achievement of interim targets and water quality standards.
(5) schedule for monitoring and evaluation of TMDL and implementation effectiveness, including source control feedback loops.

Point Source TMDL Implementation:

(1) Ecology will implement point source TMDLs beginning in Year 5 (Implementation) through the issuance or reissuance of NPDES permits. Implementation may consist of the installation of upgraded waste treatment technology, alternative treatment options or discharge sites, pollution prevention activities, or other means to reduce loadings. A compliance schedule for each waste water discharger may be agreed upon.

(2) Ecology will apply its antidegradation implementation procedures for tier two waters to applications for NPDES permits for new or expanded loads if a TMDL contains an allocation for future growth. If there is no allocation for future growth, no permits will be issued for new or expanded loads, unless offset by other reductions.

Nonpoint Source TMDL Implementation:

(1) Implementation may consist of pollution prevention activities, installation of Best Management Practices (BMPs), technical and/or financial assistance, or other means to reduce loadings. A compliance schedule for significant pollution sources will be developed.

(2) Best Management Practices (BMPs) are frequently the preferred method of implementing NPS TMDLs. Ecology may use one or more nonpoint source programs as the basis for nonpoint source TMDLs and to implement such TMDLs

(3) Ecology will ensure that a monitoring plan is implemented.

(4) Ecology will evaluate NPS and mixed source TMDLs in subsequent cycles for effectiveness.

Nonpoint Source TMDL Implementation (cont):

(5) EPA and Ecology agree that generally the following are fundamental to implementing a successful NPS or mixed source TMDL, and Ecology may tailor its watershed process as necessary and appropriate to include these factors:

(i) A locally driven implementation process.

(ii) Public understanding of the nature of the impacts to characteristic uses and sources of impairment.

(iii) Public participation in development of the implementation measures and schedules which are linked to the interim targets and final goals.

(iv) The application of relevant legal authorities and incentives, where necessary.

Public Participation

•Ecology will ensure that TMDL development includes public participation which will at a minimum meet federal requirements for public involvement (40 CFR 25, part 25.4).

•Ecology will encourage other suggested public process methods found in federal regulations (40 CFR 25, part 25.5 through 25.7), including discretionary public hearings, public meetings and advisory groups.

Response to Comments

- Ecology will also ensure that TMDL submittals include a responsiveness summary to public comments, as described in federal regulations (40 CFR, part 25.8). After an open public comment period Ecology will compile all comments and responses into a summary document. This document will summarize the public comments, criticisms and suggestions, set forth specific responses by modification of the proposed alternative or an explanation for the rejection of any proposals made by the public.

ADVISORY GROUP FUNCTION

- Assist Ecology with final decision-making responsibility by making recommendations on important issues. In addition, advisory groups should foster a constructive interchange among the various interests present on the group and enhance the prospect of community acceptance of agency action.

- With Ecology concurrence, the advisory group may select its own chairperson, adopt its own rules of order, and schedule and conduct its own meetings

- Advisory group meetings shall be announced well in advance and shall be open to the public. At all meetings, the advisory group shall provide opportunity for public comment.

ADVISORY GROUP FUNCTION (cont)

- Any minutes of advisory group meetings and recommendations Ecology shall be available to the public.
- The advisory group should monitor the progress of the project and become familiar with issues relevant to project development.
- The advisory group should make written recommendations directly to Ecology and to responsible decision-making officials on major decisions
- The advisory group should remain aware of community attitudes and responses to issues as they arise.

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Summary - Final Report

Attachment #2 – Slides from Ken's second presentation

Slide 1

Spokane River Water Quality and TMDLs

Ken Merrill
WA Dept of Ecology
329-3515
kmer461@ecy.wa.gov

Slide 2

RCW 90.48.010 Policy enunciated.

It is declared to be the public policy of the state of Washington to maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state, and to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington. Consistent with this policy, the state of Washington will exercise its powers, as fully and as effectively as possible, to retain and secure high quality for all waters of the state

Slide 3

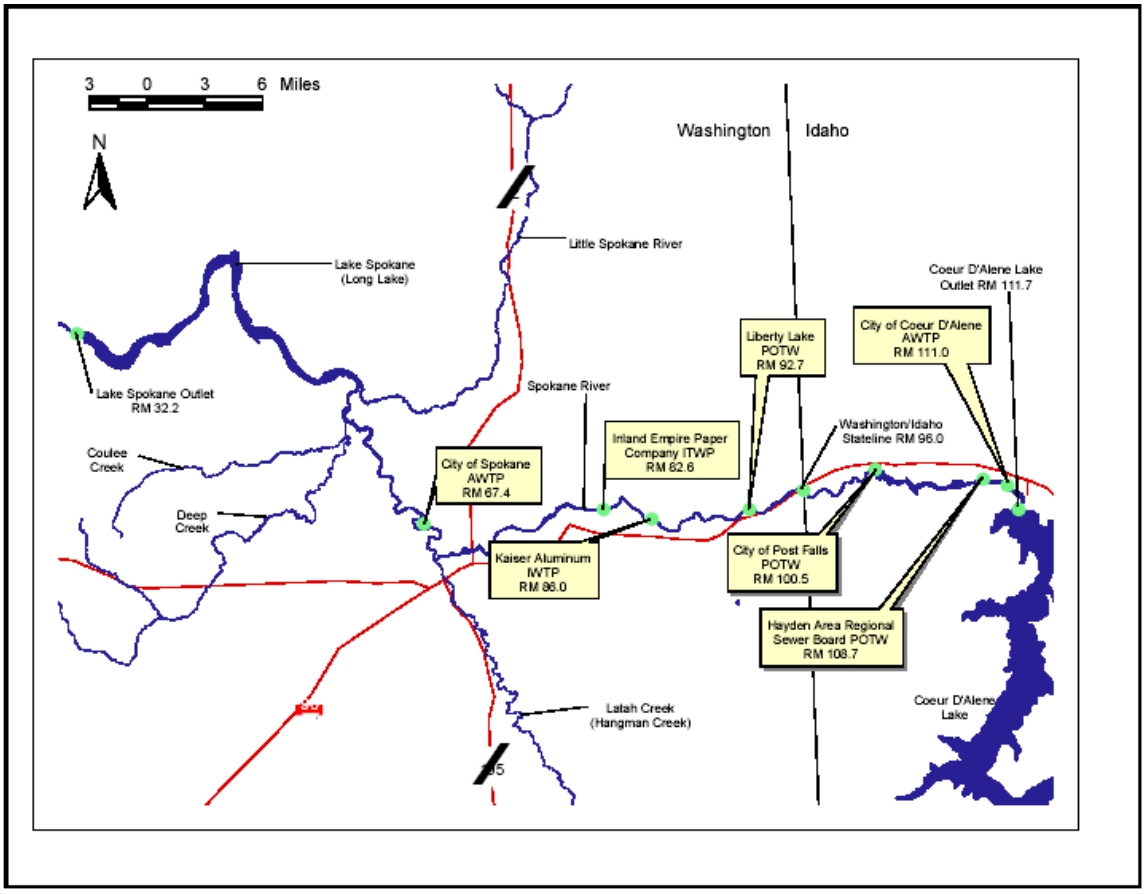

Figure 2. Spokane River and Lake Spokane study area map.

Slide 4

Spokane River and Lake Spokane (Long Lake) Pollutant Loading Assessment for Protecting Dissolved Oxygen

February 2004

Publication No. 04-03-006

http://www.ecy.wa.gov/pubs/0403006.pdf

Slide 5

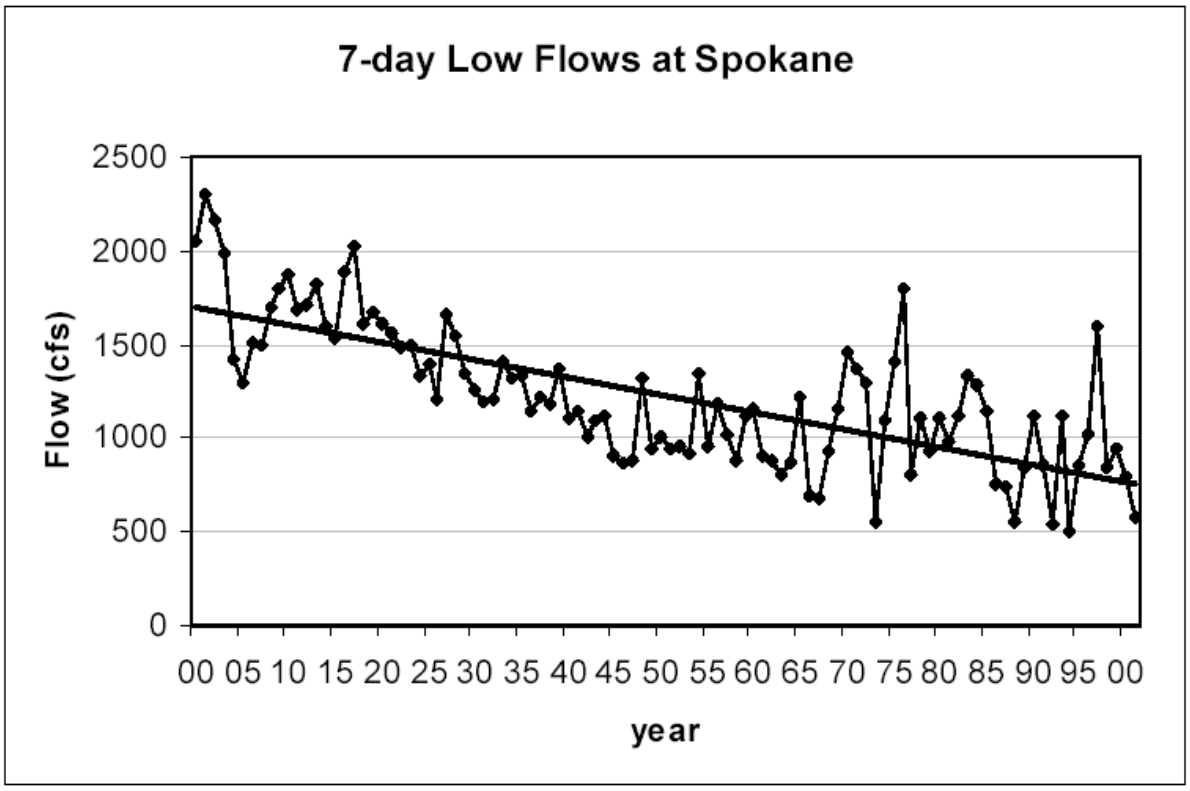

Figure 6. Annual 7-day low flows for the Spokane River at Spokane.

Slide 6

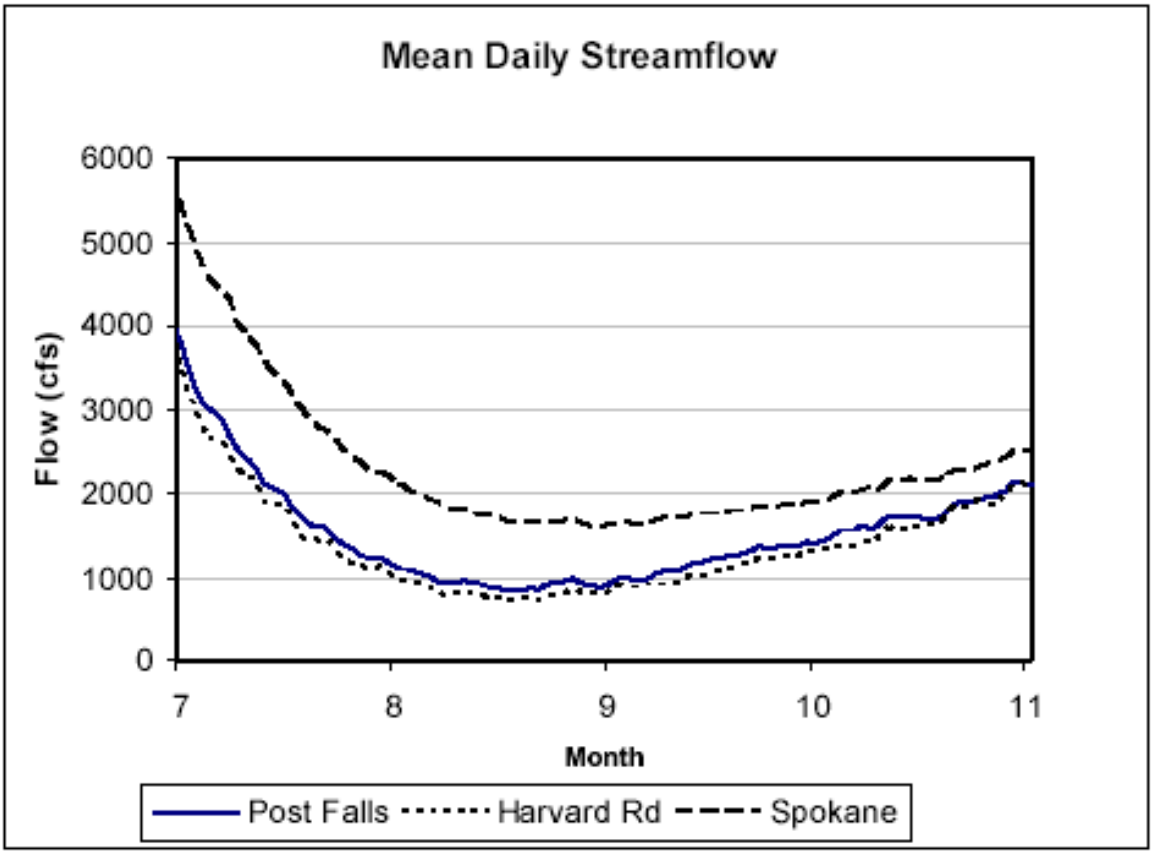

Figure 4. Average July through October hydrographs for Post Falls, Harvard Rd, and Spokane USGS gauges.

Slide 7

Slide 8


July 31, 2003 375 at Post Falls
Below Greenacres Gyspsum
August 1, 2003 500 at Post Falls

Slide 9

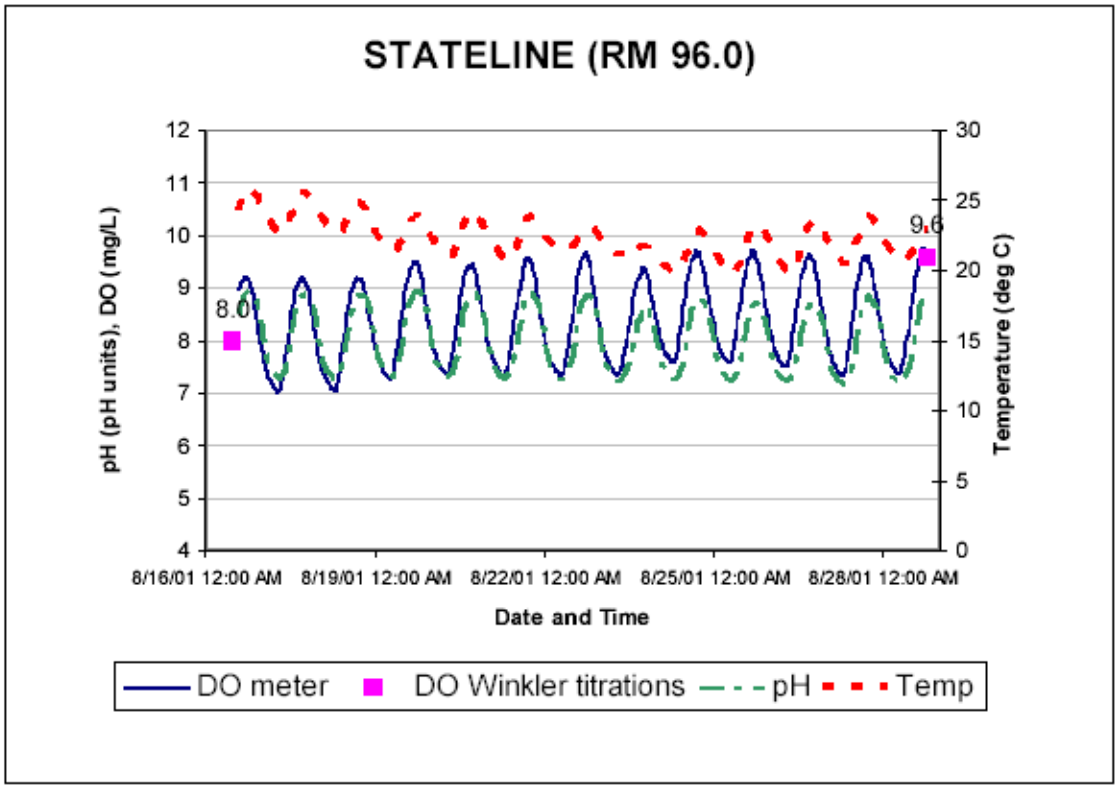

Figure 15. Diurnal data collected at the Washington/Idaho state line during August 2001.

Slide 10

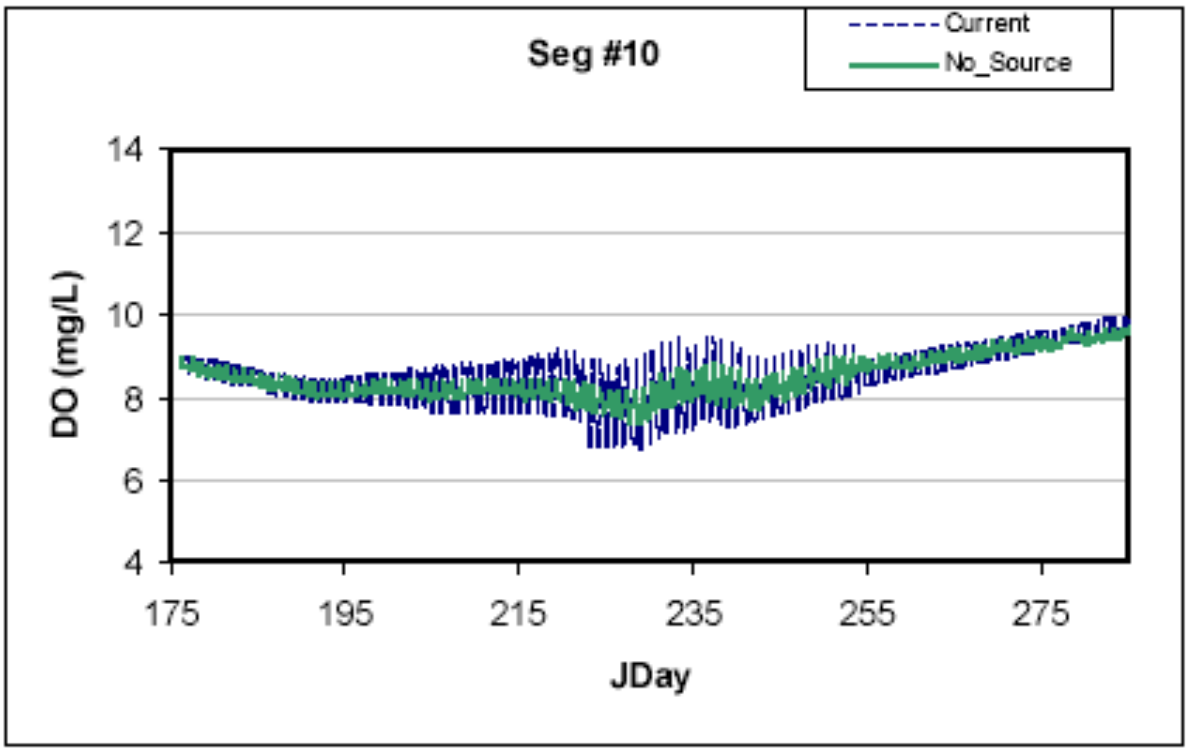

Figure 48. Model-predicted diurnal dissolved oxygen concentrations for model segment 10 located about 0.9 miles upstream of Liberty Lake POTW for Julian Days 176-284 (June 25-October 10).

Slide 11

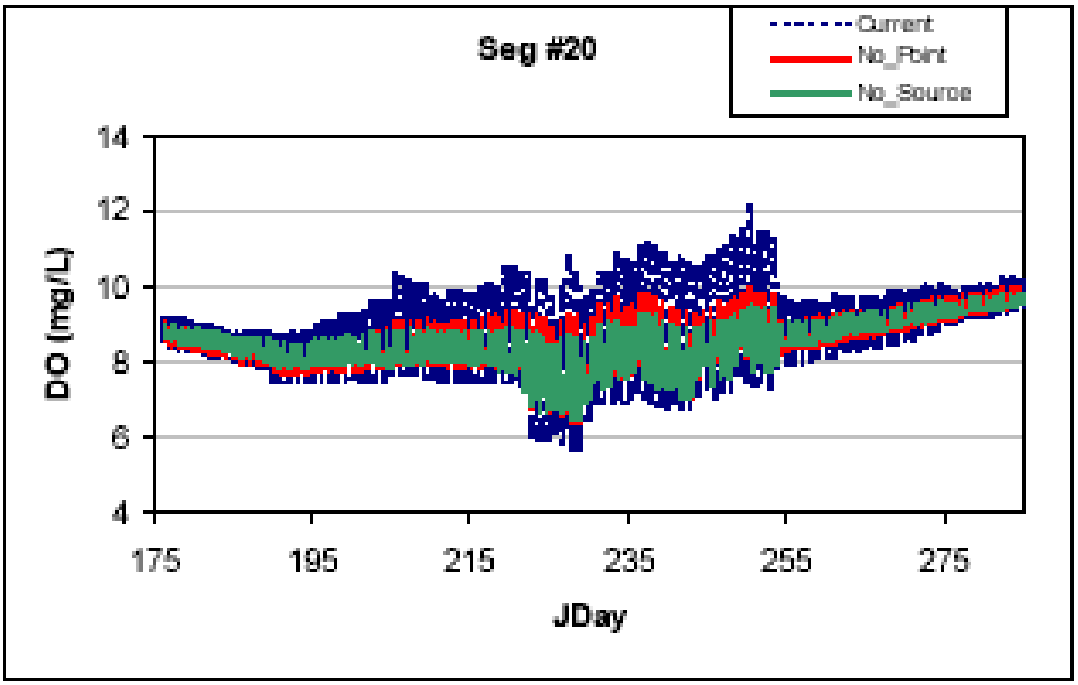

Figure 47. Model-predicted diurnal dissolved oxygen concentrations for model segment 20 located about 1.5 miles downstream of Liberty Lake POTW discharge point into segment 15 for Julian Days 176-284 (June 25-October 10).

Slide 12

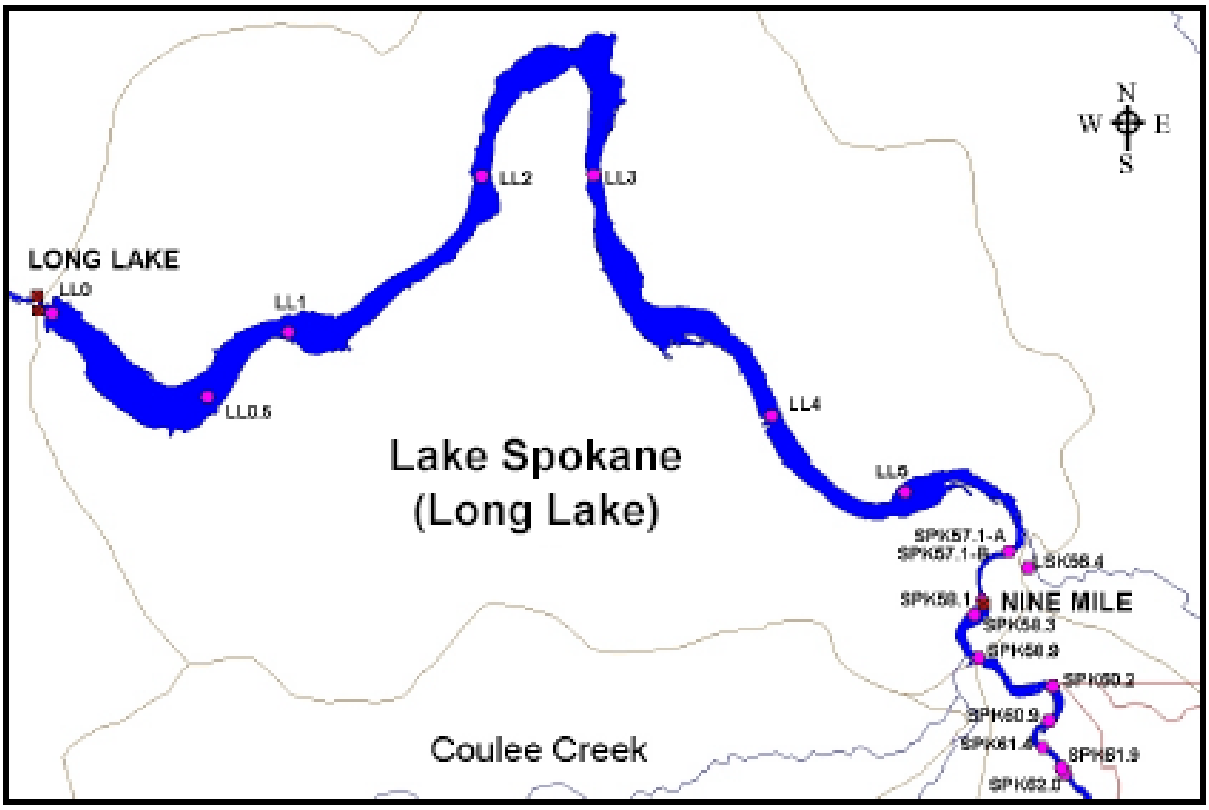

Figure 18. Lake Spokane sampling station locations.

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Slide 14

Slide 15

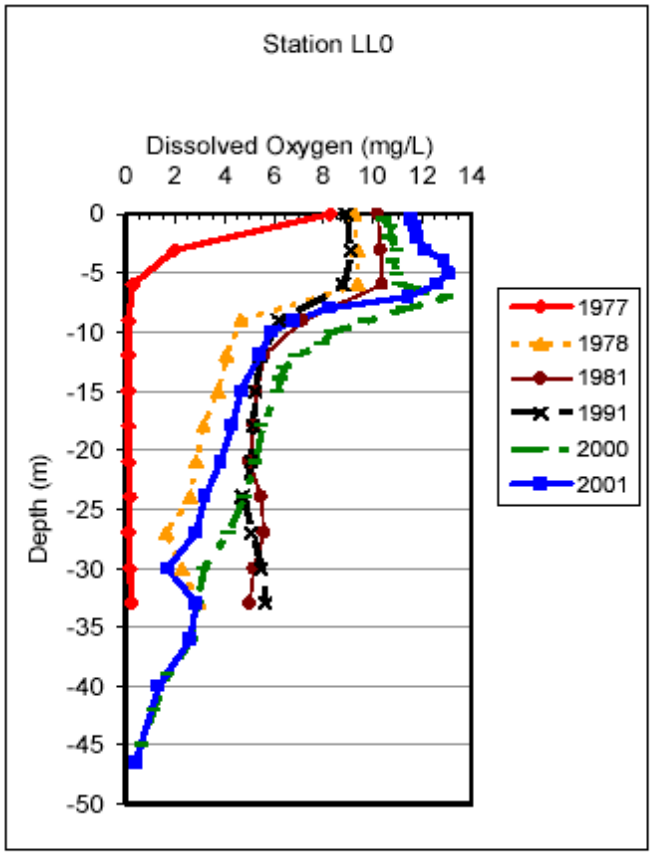

Figure 19. Lake Spokane mid to late August dissolved oxygen profile data collected at station LL0 located near the dam.

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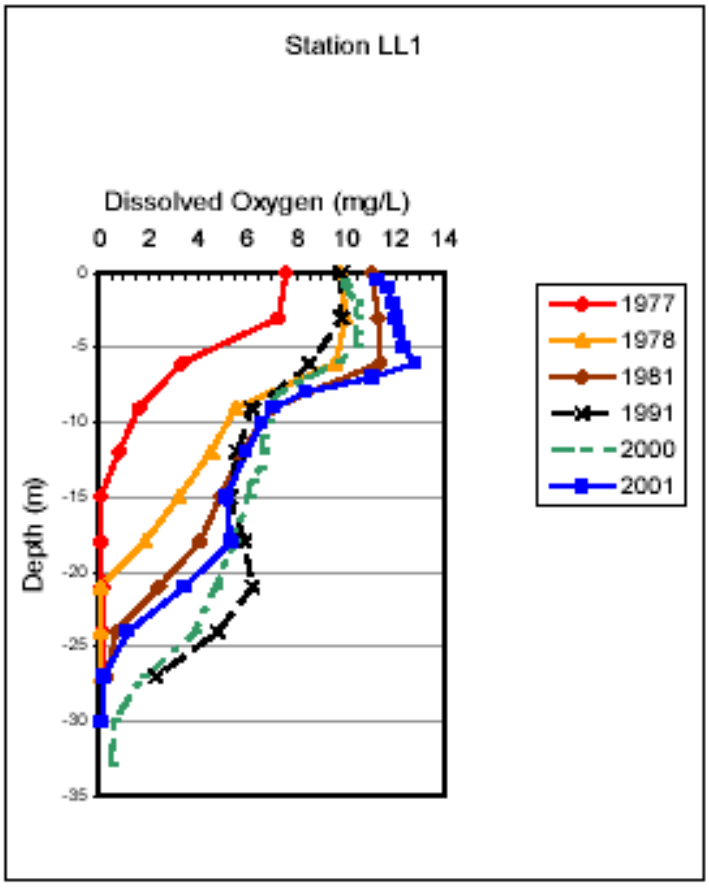

Figure 20. Lake Spokane mid to late August dissolved oxygen profile data collected at station LL1 located about 4 miles upstream of the dam.

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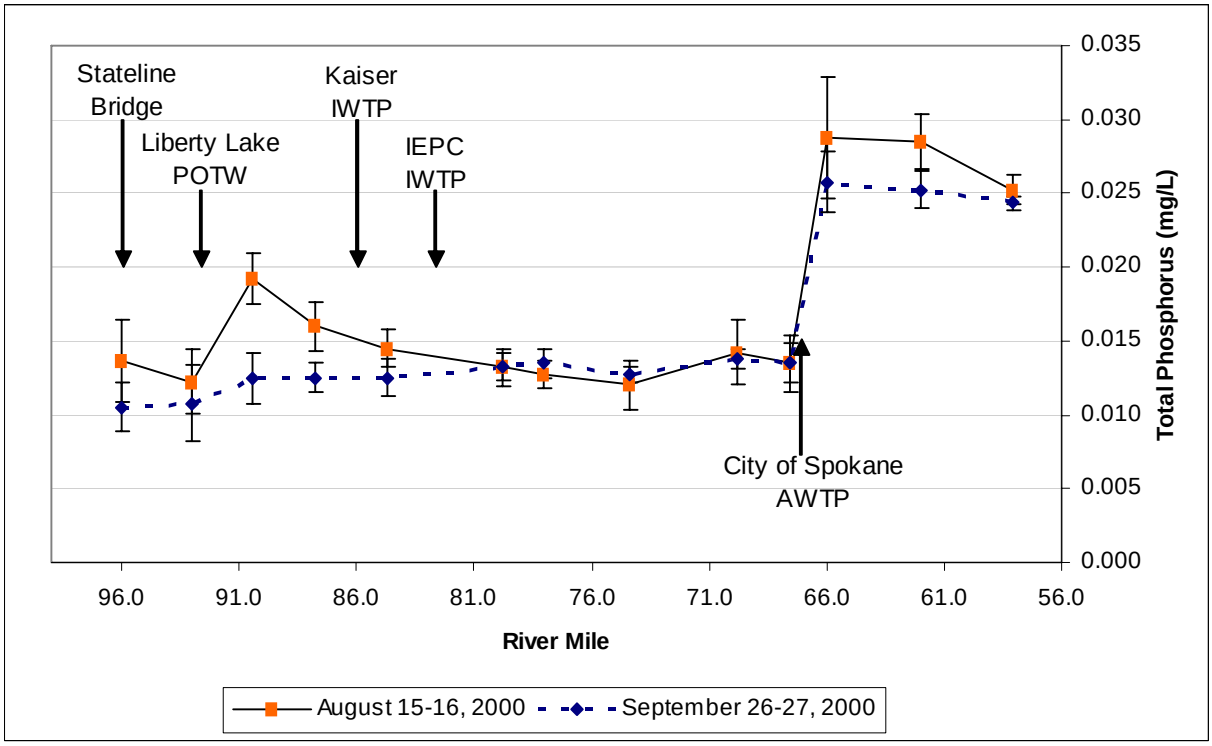
Total Phosphorus Concentration



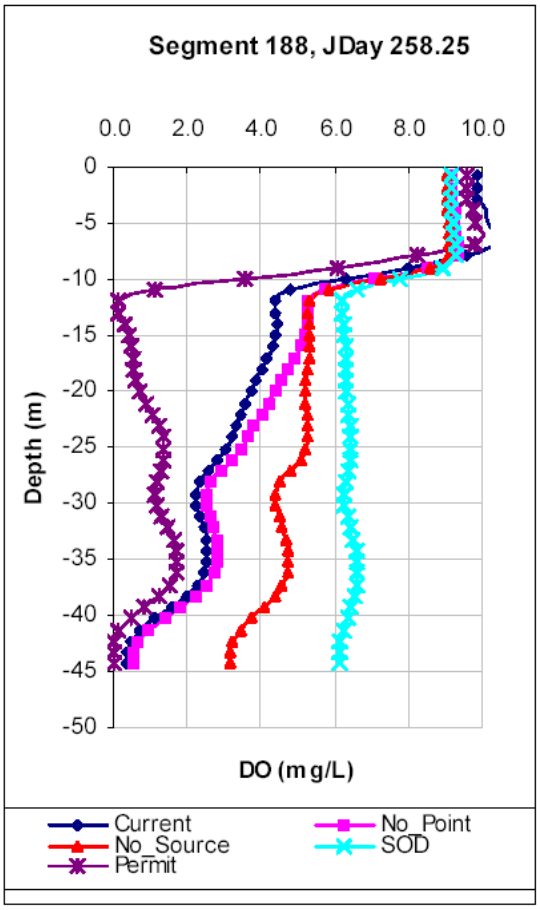
Slide 18

MODEL OUPTUT
(Idaho pt source loads are in “No Point”)

SOD scenario likely happens over multiple years if nutrient concentration is significantly and consistently reduced in the river/reservoir

http://www.ecy.wa.gov/pubs/0403006.pdf

NOTE: The affect of “nonpoint loading” cannot be determined by simply looking at the difference between the “No Point” and “No Source” scenario – Idaho pt source loads are still in the “No Point” scenario



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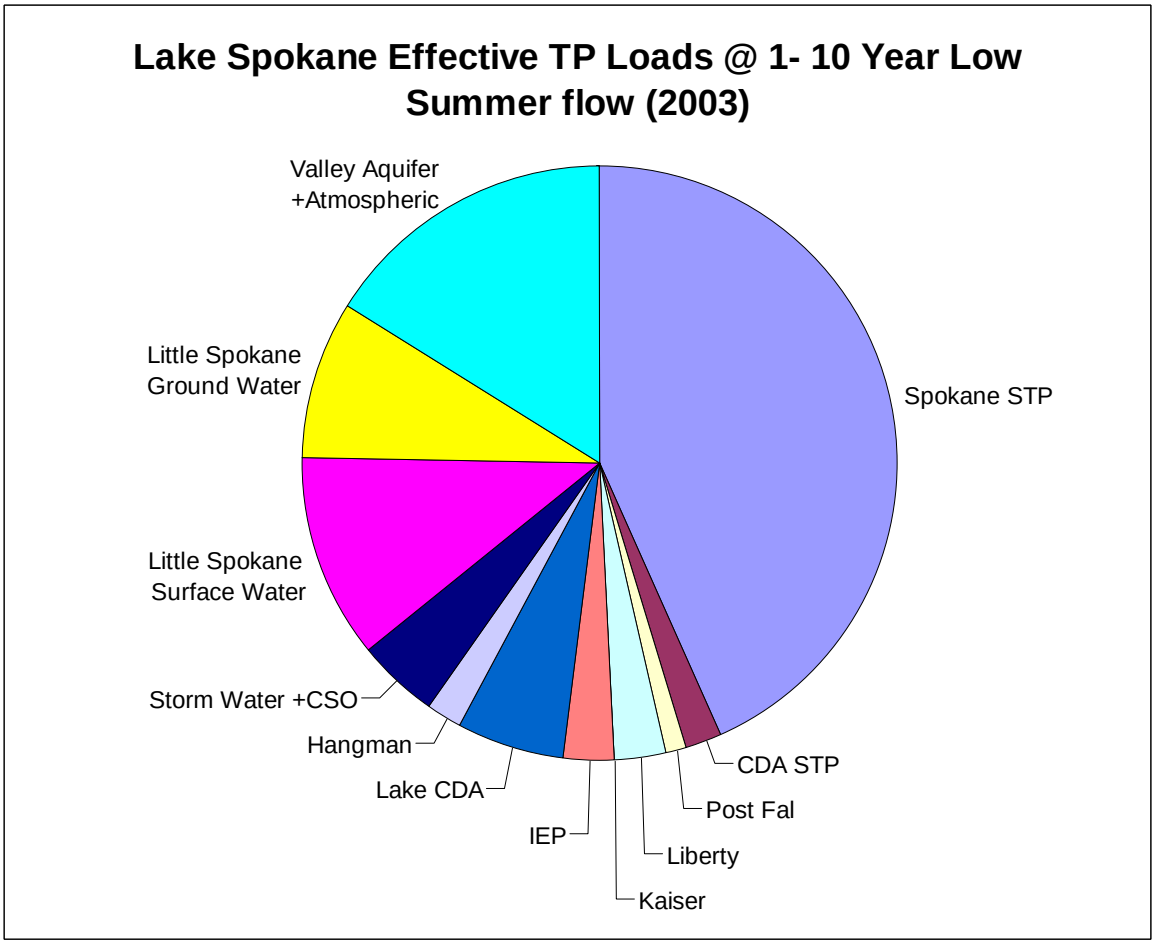
Lake Spokane Effective TP Loads @ 1- 10 Year Low Summer flow (2003)
Valley Aquifer +Atmospheric
Little Spokane Ground Water
Little Spokane Surface Water
Storm Water +CSO
Hangman
Lake CDA
IEP
Kaiser
Liberty
Post Fal
CDA STP
Spokane STP

Slide 20

Table 14. P-attenuation model results without point source dischargers and 91% total phosphorus removal from CSOs and stormwater.

Parameter	Prediction	Standard Error	Target Criteria
EZ mean TP	11.8	2.4	25 ug/L
EZ Chl *a* - upper 95%tile	14.2	3.1	<16 ug/L
EZ Chl *a* – mean	7.3	1.6	10 ug/L
EZ Phyto. Biovolume	1.4	0.4	5 mm^3/L
Secchi Disk Depth	4.2	0.6	3 meters
Extinction Coefficient	0.56	0.008	0.5/m
Minimum Hypolimnetic DO	9.8	3.5	>4 mg/L

EZ = euphotic zone
DO = dissolved oxygen

Conclusions and Recommendations

1. The historical data indicate that the current TMDL may need to be reduced by more than 50% to control late summer-fall algal blooms that occur in the upper end of the lake.

Conclusions and Recommendations (cont)

2. There are three major water quality issues related to dissolved oxygen concentrations:

- Periphyton growth causes diurnal minimum dissolved oxygen concentrations in some locations in the river to drop below 8 mg/L.

- Hypolimnetic dissolved oxygen concentrations in Lake Spokane are depressed due to human-caused internal and external biological oxygen demand (BOD) loading.

- Excessive phytoplankton growth due to human causes increases internal loading of BOD to Lake Spokane and decreases hypolimnetic dissolved oxygen concentrations.

Conclusions and Recommendations (cont)

3. Excessive algal growth in the upper end of the lake also causes aesthetic impairment that was not adequately addressed by the existing phosphorus TMDL.

4. The major conclusions that can be drawn from the model results for the critical year scenarios are as follows:

• Dissolved oxygen depletion predicted by the model due to human causes is far in excess of the allowable 0.2 mg/L

• **On an annual basis**, the effects of point source BOD and phosphorus loading on dissolved oxygen concentrations during the summer are predicted to be the greatest in the interflow zone or metalimnion of the lake. The greatest effects of the nonpoint sources are predicted to be in lower depths.

Conclusions and Recommendations (cont)

•Diurnal dissolved oxygen concentrations in the river are caused by photosynthesis and respiration of periphyton. Reducing phosphorus loading to the river reduces the diurnal range of dissolved oxygen.

• Managing pollutant loads and associated oxygen deficits in the lake also will likely protect water quality in the river.

• Current monthly permitted BOD5 loading would cause significant degradation of dissolved oxygen in Lake Spokane beyond current levels.

Conclusions and Recommendations (cont)

5. If point and nonpoint sources of BOD and phosphorus are reduced, overtime sediment oxygen demand (SOD) will be reduced which will lead to higher dissolved oxygen concentrations in the lower depths of Lake Spokane.

6. During August 2003, field sampling was conducted in the Spokane River reach just downstream of the Liberty Lake POTW discharge point. The data verified the large diurnal ranges of dissolved oxygen predicted by the CE-QUAL-W2 model.

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Classification and Water Quality Criteria

The Spokane River water quality classifications and dissolved oxygen criteria are:

Portion Of Study Area	Classification	Dissolved Oxygen Criterion
Lake Spokane or Lake Spokane (from Lake Spokane Dam to Nine Mile Bridge)	Lake Class	No measurable decrease from natural conditions.
Spokane River (from Nine Mile Bridge to the Idaho border)	Class A	Dissolved oxygen shall exceed 8.0 mg/L. If "natural conditions" are less than the criteria, the natural conditions shall constitute the water quality criteria.

Slide 28

MODEL OUPTUT
(Idaho pt source loads are in “No Point”)

SOD scenario likely happens over multiple years if nutrient concentration is significantly and consistently reduced in the river/reservoir

http://www.ecy.wa.gov/pubs/0403006.pdf

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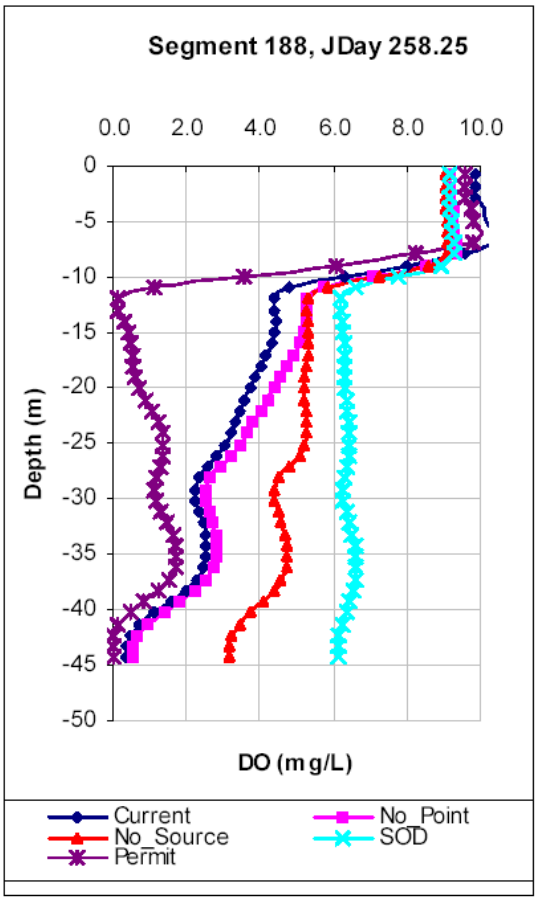

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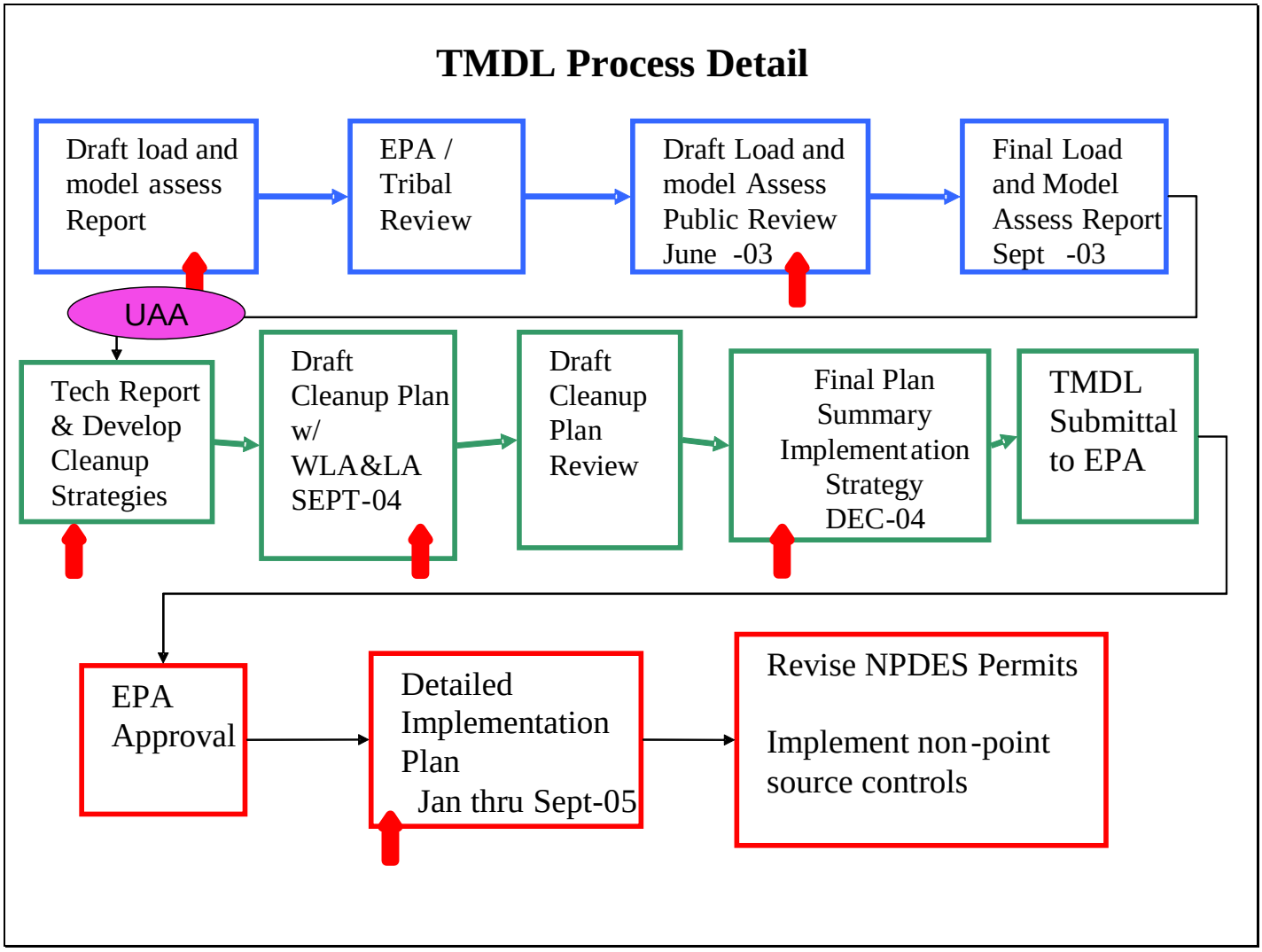
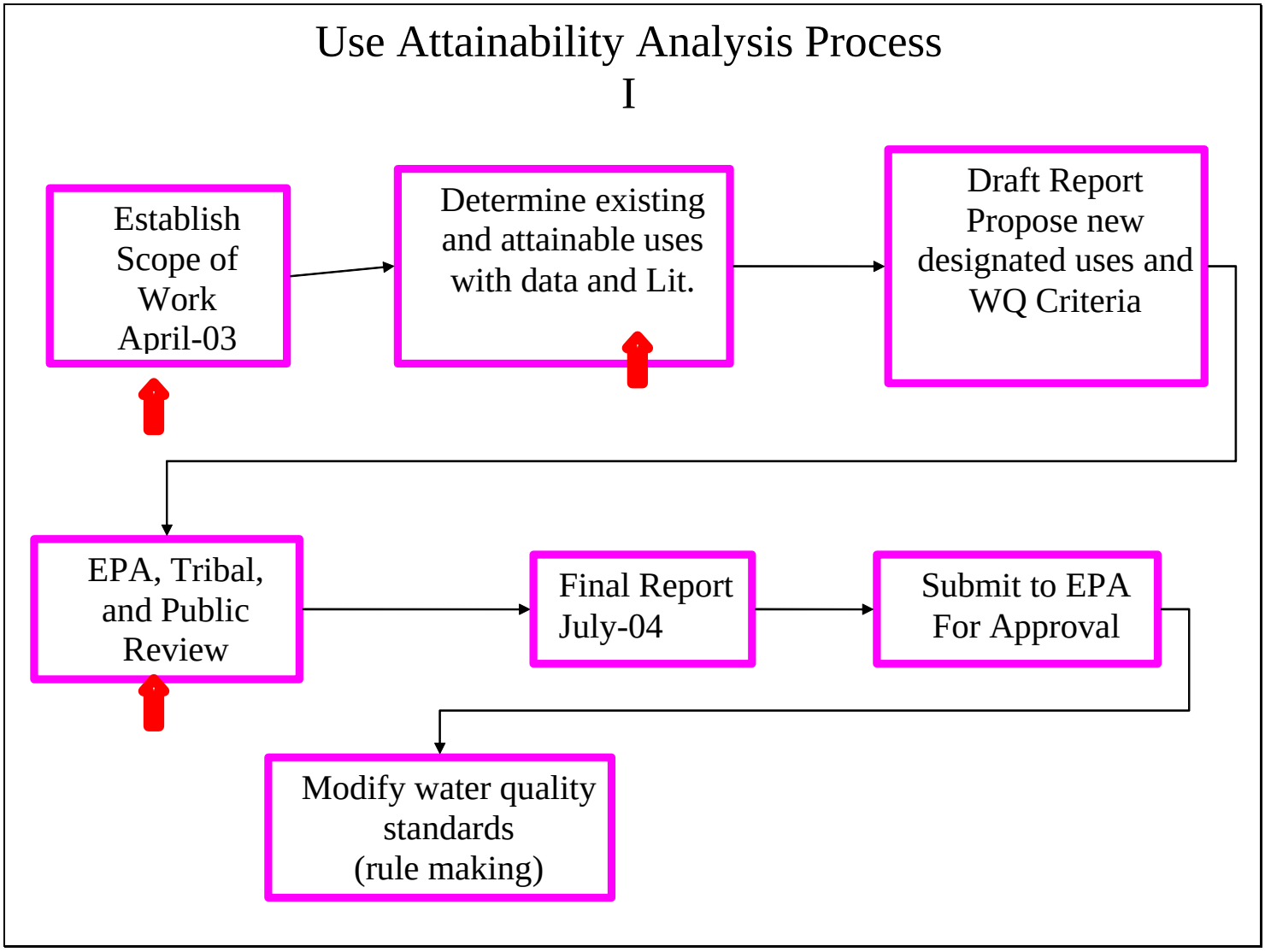

TMDL Process Detail
Draft load and model assess Report
EPA / Tribal Review
Draft Load and model Assess Public Review June -03
Final Load and Model Assess Report Sept -03
UAA
Tech Report & Develop Cleanup Strategies
Draft Cleanup Plan w/ WLA&LA SEPT-04
Draft Cleanup Plan Review
Final Plan Summary Implementation Strategy DEC-04
TMDL Submittal to EPA
EPA Approval
Detailed Implementation Plan Jan thru Sept-05
Revise NPDES Permits
Implement non-point source controls

Slide 30


Use Attainability Analysis Process
I
Establish Scope of Work April-03
Determine existing and attainable uses with data and Lit.
Draft Report Propose new designated uses and WQ Criteria
EPA, Tribal, and Public Review
Final Report July-04
Submit to EPA For Approval
Modify water quality standards (rule making)

Slide 31

Timeline for a TMDL to Protect Spokane River and Lake Spokane Dissolved Oxygen

Pollutant Loading Assessment, Use Attainability Assessment, and Formal Adoption

September 2003

Revised – May 2004

Slide 32

FUTURE MILESTONES

UAA and TMDL / Waste Load Allocation - Formal Adoption Process

(original presented Sept 2003 – needs revised)

Use Attainability Analysis (15 months)

- **May 2003: CH2M Hill UAA Scope of Work**
- **Sept 2003: Preliminary review of existing data and literature**

*****needed changes in blue*****

- **April 2004: Draft UAA report with recommendations**
- **July 2004: Ecology/EPA concurrence prior to beginning completion of TMDL**

UAA and TMDL / Waste Load Allocation - Formal Adoption Process (cont.)

DO TMDL Submittal with SIS (6 months)

- July 2004: Draft Submittal Report with modeling assessment and UAA
- Nov 2004: WLA/LA and SIS
- Dec 2004: Draft Submittal Report to EPA for Conditional Approval with proposed revision to WQ stds.

UAA and TMDL / Waste Load Allocation - Formal Adoption Process (cont.)

Formal Rules Revision and DIP

- Jan – Dec 2005: WQ Standards Revisions
- Detailed Implementation Plan

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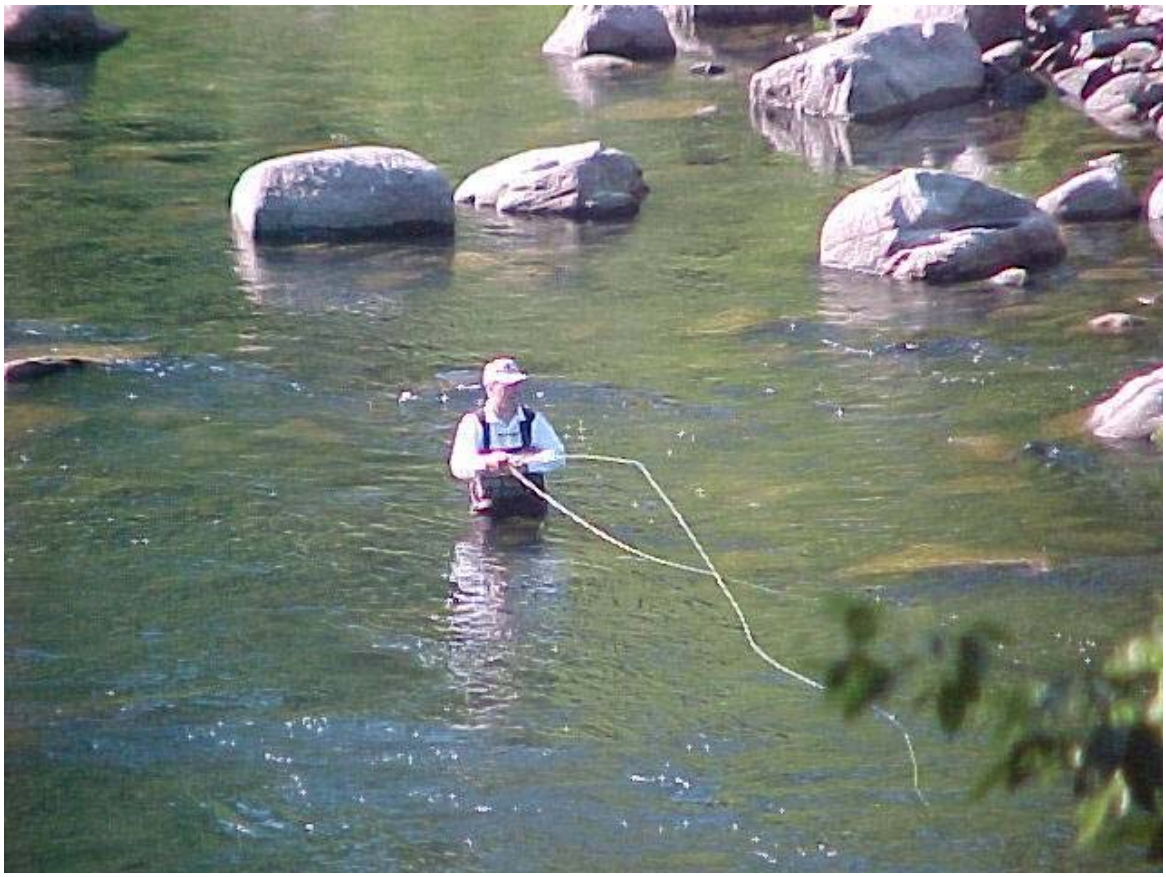

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